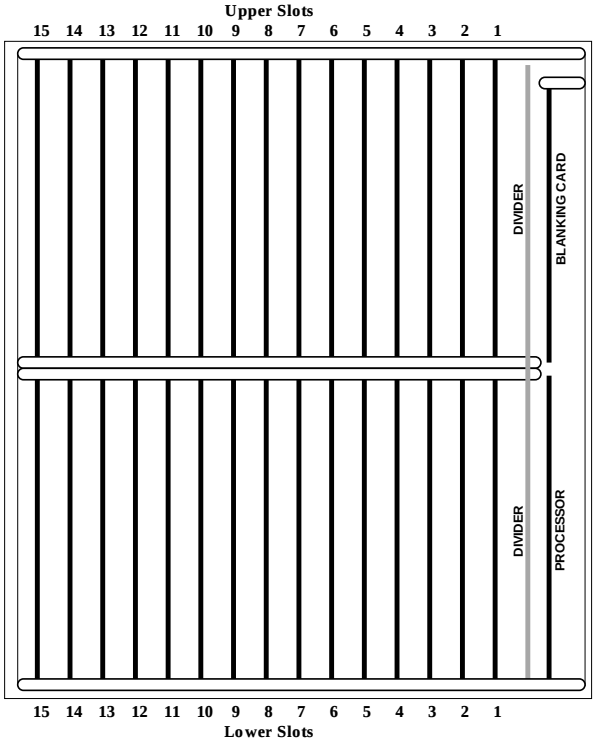
The Computer Rack



The Computer Rack contains two rows of cards. The upper row includes the Printer Interface (optional), but is otherwise broadly dependent upon the size of the console and whether Ultimation is incorporated; the lower row includes the processor, memory, video, and other 'special function' cards, and is otherwise dependent upon the types of storage devices (floppy disks, Bernoulli Drives) fitted.

The tables below and opposite show the upper and lower row card slot contents for all the normal variants of console size, features, and processor type.

On the following pages will be found instructions for checking the configuration of the cards within the computer and for installing the various categories of cabling.

Computer Rack - Upper Row

Card Slot	G-Series (up to 40 Ch)	G-Series (41-56 Ch)	G-Series (57-88 Ch)	G-Series (89-128 Ch)	Ultimation (up to 64 Ch)	Ultimation (65-128 Ch)
Upper 1	622121E1	622121E1	622121E1	622121E1	622121E1	622121E1
Upper 2	622041E1	622041E1	622041E1	622041E1	622041E2	622041E2
Upper 3	622042E1	622042E1	622042E1	622042E1	622357E1	622357E1
Upper 4	—	—	—	—	—	—
Upper 5	—	—	—	—	—	—
Upper 6	'047+3x'053	'047+3x'053	'047+3x'053	'047+3x'053	622356E1	622356E1
Upper 7	—	—	622041E1	—	—	622041E2
Upper 8	—	—	622042E1	'047+2x'053	—	622357E1
Upper 9	—	'047+1x'053	—	622041E1	—	—
Upper 10	—	—	—	622042E1	—	—
Upper 11	—	—	'047+3x'053	—	—	622356E1
Upper 12	—	—	—	—	622366E1 †	622366E1 †
Upper 13	—	—	—	'047+3x'053	622366E1 †	622366E1 †
Upper 14	—	—	—	—	622366E1 †	622366E1 †
Upper 15	622119E1 †	622119E1 †	622119E1 †	622119E1 †	622119E1 †	622119E1 †

†: Option

Upper Row Card Descriptions:

622121E1	Bus Driver Card - All Systems
622041E1	Analogue Input Card - G-Series Systems
622041E2	Analogue Input Card - G-Series & Ultimation Systems
622042E1	Analogue Output Card - G-Series Systems
622357E1	Analogue Output Card - Ultimation Systems Only
622047E1	LEDs and Switches Mother Card - G-Series Systems
622053E1	LEDs and Switches Daughter Card - G-Series Systems
622356E1	LEDs and Switches Card - Ultimation Systems Only
622366E1	Ultimation Interface Card - Ultimation Systems Only
622119E1	Printer Interface Card - All Systems

Computer Rack - Lower Row

Card Slot	G-Series with 8” Floppy Drive, Bernoulli, and 3.5” Floppy Drive	G-Series with Bernoulli and/or 3.5” Floppy Drive
Processor	63CBC011*(+ 622071E1 Half Card)*	63CBC011*(+ 622071E1 Half Card)*
Lower 1	63CBCH03 / 4	63CBCH03 / 4
Lower 2	63CBDD01	622046E1
Lower 3	622044E1	622044E1
Lower 4	622046E1	622043E1
Lower 5	622043E1	622078E1 †
Lower 6	622078E1 †	—
Lower 7	—	—
Lower 8	622090E1 ‡	622090E1 ‡
Lower 9	622089E1 ‡	622089E1 ‡
Lower 10	—	—
Lower 11	—	—
Lower 12	—	—
Lower 13	—	—
Lower 14	—	—
Lower 15	622112E1 / 2	622112E1 / 2

‡: Total Recall Option †: Other Option

Lower Row Card Descriptions:

63CBC011	CA 4-100 / C Half Card Processor *(622071E1 Half card in ‘Blanking Card’ slot.)*
63CBCFH0	Foreman-Hart Full Card Processor *(Occupies ‘Processor’ and ‘Blanking Card’ slots.)*
63CBDD01	CA Floppy Disk Controller
63CBCH03	CA 2MB 988 Non Cache Memory
63CBCH04	CA 2MB Cache Memory
63CBCH10	Micro Analytic 2MB Memory
63CBDQ11	Micro Analytic SASI Interface
622044E1	Keyboard / VDU Interface
622046E1	Timecode Reader
622043E1	Tape Machine Interface
622078E1	CA Interface for Sync / Events / **motionworker™**
622090E1	Total Recall Graphics
622089E1	Total Recall Processor
622112E1	Video Switch and Distribution
622112E2	Video Switch

Additional Notes

- 622366E1 Ultimation Interface Cards may be fitted in any convenient ***upper*** row card slots. See Page 31 for further details.

Studio Computer PCB Configuration

The Computer PCBs are generally supplied from the factory configured for the intended application. Where a console is supplied with empty bays for future expansion, please note that the computer will be supplied with the required cards to interface with the console in its 'fully populated' state. (Refer to the tables on Pages 28-29.) Thus, when channels strips are added to existing empty console bays, no reconfiguration of the computer should normally be required.

All Consoles

622306E1 Computer Interface Card

There is one link on the 622306 card; this link should always be fitted.

622112E2 Video Switch Card

There are a number of links on the 622112 card; all of these links are facory set, and should not require further adjustment.

Consoles without Ultimation™

622047E1 Lights and Switches Cards

Between one and three 622047 Lights and Switches Mother Cards are fitted in the computer, depending upon the size of the console. On each of these cards is mounted between one and three 622053 Lights and Switches Daughter Cards.

622041E2 Analogue Input Card

The 622041E2 Analogue Input Card offers better input filtering and higher input impedance than the 'E1 version used previously, for which it is a direct replacement. Consoles with up to 64 faders require one 622041 card; consoles with more than 64 faders require a second card. Check that the '1-64' link is set on Card 1 and that the 'Over 65' link is set on Card 2 (if fitted).

622042E1 Analogue Output Card

Consoles with up to 64 faders (*plus* the master fader) require one 622042E1 Analogue Output Card; consoles with more than 65 faders require a second card. The '1-64' link must be fitted on Card 1 to set the card address to correspond to faders 1-64; the 'over 65' link should be set on Card 2 (if fitted) to set the address to correspond to faders 65-128.

As well as the channel faders, group faders and patchable VCA faders must be included in the above totals. (For example, a single 622042E1 Analogue Output Card can accommodate a console with 56 channel faders , 8 group faders, and a master fader.

Studio Computer PCB Configuration (continued)

Consoles with Ultimation™

622356 Control Interface Cards

Ultimation consoles use either one or two 622356 Control Interface Cards. These cards have two links, LK1-2 which set the card address to correspond either to faders 1-64 or to faders 65-128. Card 1 must always have LK1 fitted; card 2 must always have LK2 fitted.

PL1-4 on 622356 cards connect to the 'Lights and Switches' connectors on the Studio Computer connector panel. For Card 1, PL1 connects to '1-16', PL2 to '17-32', PL3 to 'VCA 1-8, 33-40' and PL4 to '41-56'.

622041E2 Analogue Input Card

The 622041E2 Analogue Input Card offers better input filtering and higher input impedance than the 'E1 version used previously, for which it is a direct replacement. Consoles with up to 64 faders require one 622041 card; consoles with more than 64 faders require a second card. Check that the '1-64' link is set on Card 1 and that the 'Over 65' link is set on Card 2 (if fitted).

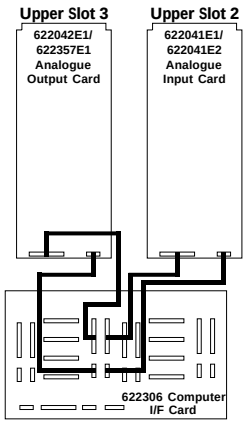
622357E1 Analogue Output Card

Consoles with up to 64 faders require one 622357 Analogue Output Card; consoles with more than 64 faders require a second card. Check that the '1-64' link is set on Card 1 and that the 'Over 65' link is set on Card 2 (if fitted).

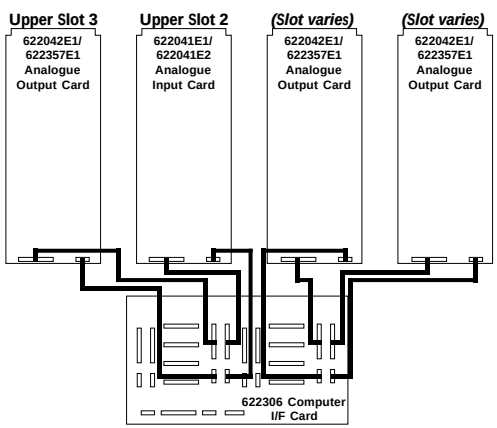
622366E1 Ultimation Interface Card

The 622366E1 Ultimation Interface Card is required in Ultimation systems incorporating either Joystick or Programmable EQ systems. One card per **FADER** connector (see Pages 36-37) is required: each pair of Joysticks uses one 622366E1 card; each Programmable EQ system uses three 622366E1 cards. These cards are always located in the upper row of the computer rack.

Analogue I/O Cabling

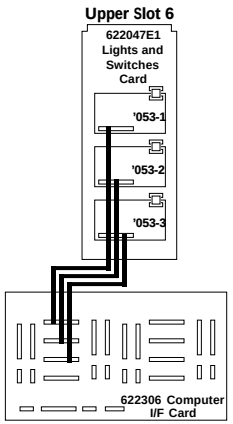


Up to 56 Channels

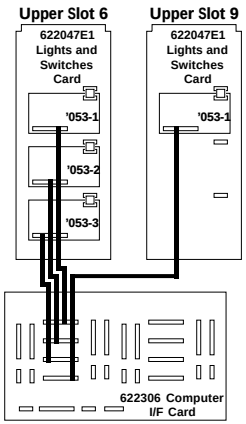


57-128 Channels

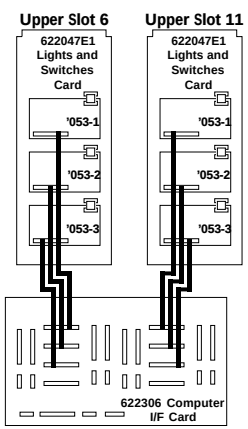
Lights & Switches Cabling



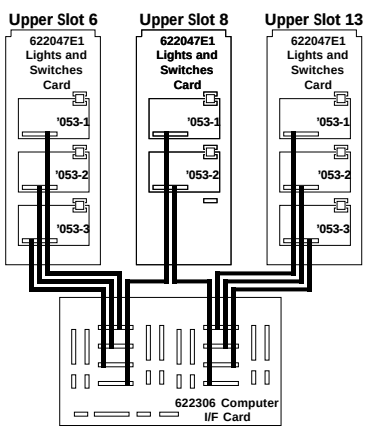
Up to 40 Channels



41-56 Channels

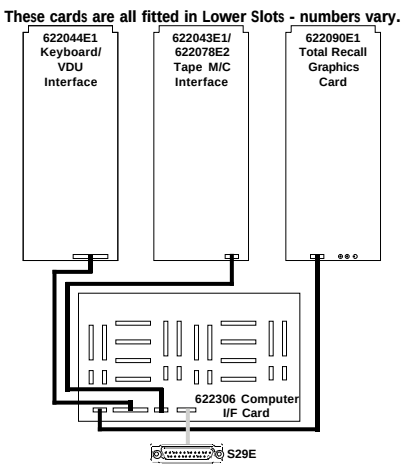


57-88 Channels



89-128 Channels

Miscellaneous Cabling



Studio Computer Internal Wiring

The diagrams opposite show the various categories of signal cabling between the computer rack PCBs and the rear panel. External connections are made to the rack rear panel connectors, most of which are mounted on a 622306 Computer Interface Card. Connections to the rear panel from the various computer PCBs are also made via this card.

Analogue I/O Cabling

One 50-way and one 20-way ribbon cable are used for each Analogue Input and Analogue Output card. Thus a total of four cables are required for consoles of up to 56 channels; consoles of 57 channels or more require a total of eight cables. Connections to the 622306 card are shown opposite.

Lights and Switches Cabling

One 50-way cable is required for every 16 console channels (and VCA Groups). These cables connect between the 622053 Lights and Switches Daughter Cards and the 622306 card, as shown opposite. Where a console is supplied with empty bays for future expansion, please note that the computer will be supplied pre-cabled to interface with the console in its 'fully populated' state. (Refer to the tables on Pages 28-29.) Thus, when channels strips are added to existing empty console bays, no reconfiguration of the computer hardware should normally be required.

Miscellaneous Cabling

Graphics

Three video cables connect the RGB signals from the 622090E1 Graphics Card to corresponding sockets on the rear panel.

Total Recall data is carried between the 622090 card and the 622306 card via a 20-way ribbon cable (see opposite).

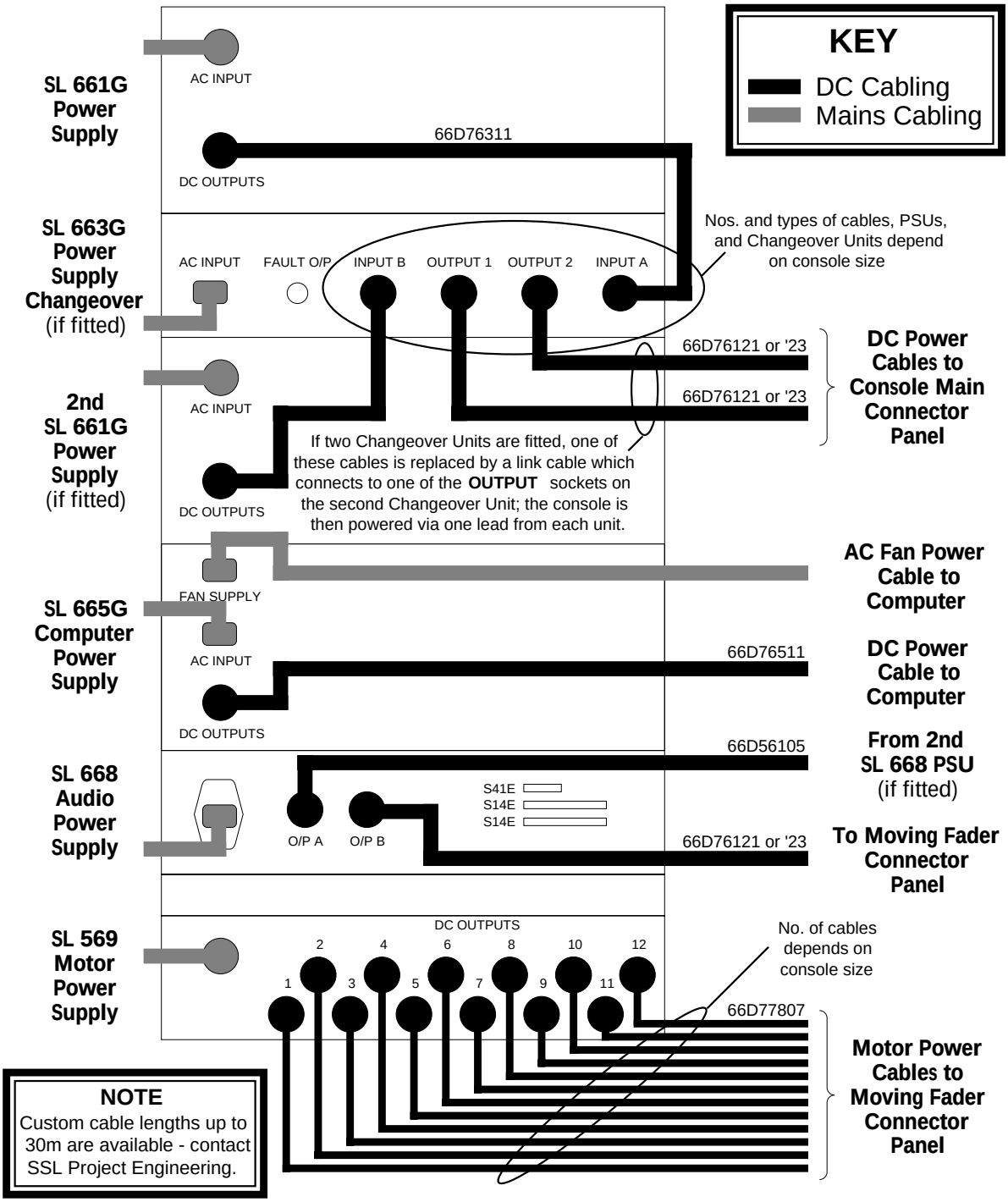
Keyboard

One 50-way ribbon cable connects the 622044E1 Keyboard/VDU Interface Card to the 622306 card (see opposite).

Machine Control

One 20-way ribbon cable, designated S30E, connects the 622043E1 Tape Machine Interface Card to the 622306 card (see opposite). The 622043 card incorporates an interface between S30E and S29E connector pinouts, allowing a connection to the computer rear panel S29E connector as shown. This allows a tape machine to be connected directly to the computer rack.

Console Channels/ Details	No. of SL 661 Console PSUs	Details of Changeover Unit	With Ultimation:- No. of SL 569 Motor PSUs	With Ultimation:- No. of SL 668 Audio PSUs
32	1	-	1	1
40	1	-	1	1
48	2	1 x 2-way	1	1
56	2	1 x 2-way	1	1
64	2	1 x 2-way	1	1
72, VU Displays	2	1 x 2-way	1	1
72, Plasma Displays	3	1 x 3-way	1	1
80	3	1 x 3-way	1	1
88	3	1 x 3-way	1	2
96	4	2 x 2-way	1	2



Studio Computer External Wiring - Power Supplies

The console and computer power supplies are mounted in the computer rack. Circuit breakers provide current overload protection for each console bay and allow bays to be isolated to facilitate fault finding. These are fitted under the console (under the patch if it is integral, elsewhere under the console if the patch is remote).

The table opposite shows the power supplies required for each console size; the diagram shows typical power cabling for an Ultimation console of between 48 and 72 channels. The following points should also be borne in mind:-

- The table on Page 13 provides power consumption and power dissipation figures, and should be consulted when specifying your air conditioning system.

- Consoles of 32 or 40 channels do not require a Changeover Unit (unless 'power backup' is needed - e.g. for broadcast consoles); the console connects via a cable (SSL Part No. 66D76121 - 10m, 66D76123 - 15m) directly to the SL661 Console PSU **DC OUTPUTS** socket.

- Consoles using more than one power supply also require a Changeover Unit (see opposite). An audible warning and failure indication is given in the event of power supply failure. Connections between the Changeover Unit and SL661 Console PSUs are via 1m cables (SSL Part No. 66D76311). The console is fed power via two cables (SSL Part No. 66D76121 - 10m, 66D76123 - 15m).

- 3-way Changeover Units (see table) are fed by *three* (instead of *two*) SL661 Console PSUs, but connect to the console in exactly the same way as for the 2-way Changeover Unit described above and shown opposite.

- For 96 channel consoles using four SL661 PSUs and two 2-way Changeover Units (see table), each Changeover Unit is fed by two SL661 PSUs, and the console is fed power via one cable (SSL Part No. 66D76121 - 10m, 66D76123 - 15m) from each Changeover Unit. (Either **OUTPUT** socket may be used.) The other **OUTPUT** sockets are linked using a 1m lead (SSL Part No. 66D76321).

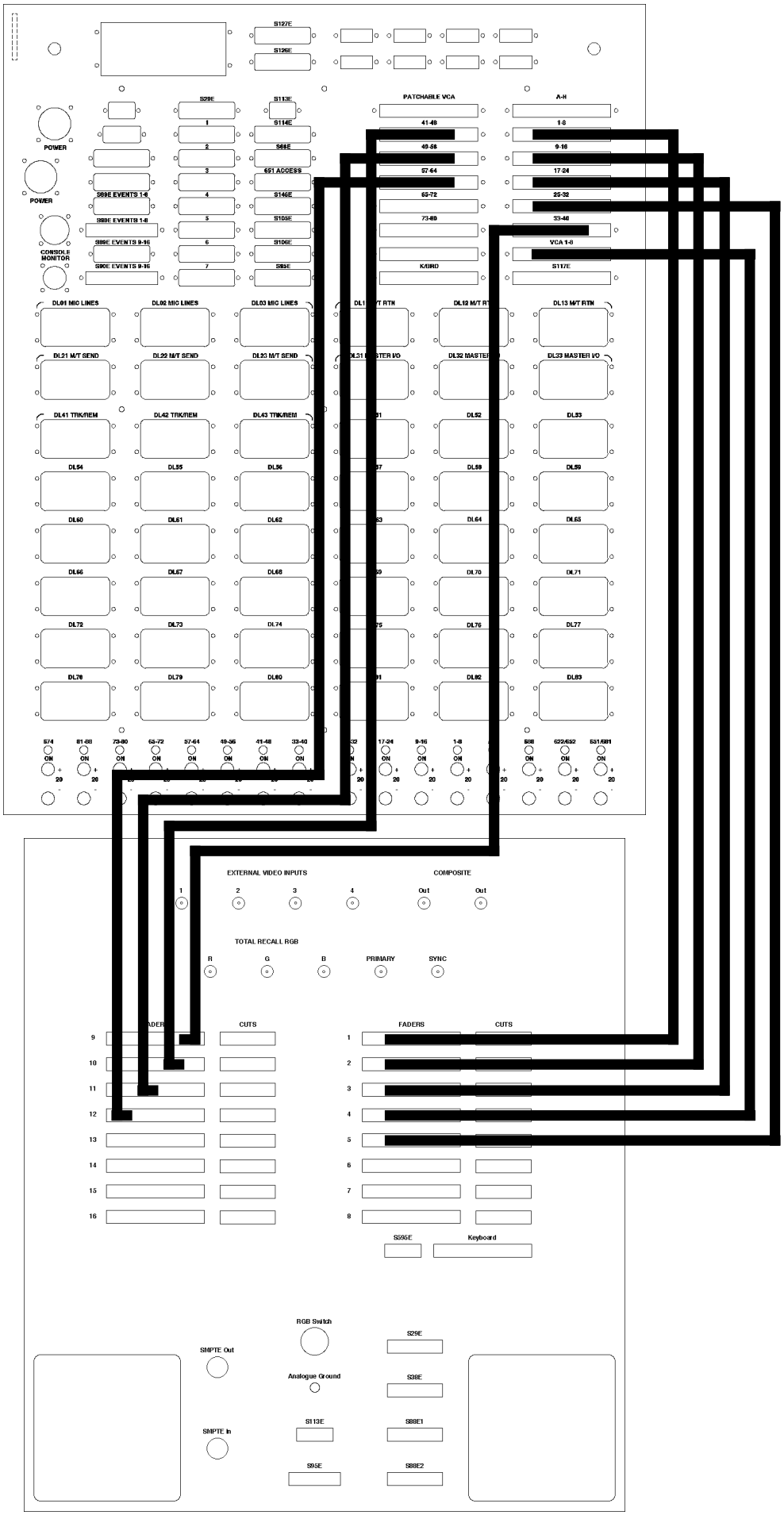
Ultimation™

Ultimation consoles also require one SL569 Fader Motor PSU and one or two SL668 Audio PSUs for the faders' analogue and logic circuitry (see table opposite). Circuit breakers are fitted under the console for these supplies.

- The Audio PSU connects to the console via a power cable (SSL Part No. 66D76121 - 10m, 66D76123 - 15m). (A 10m cable is supplied as standard.)

- If a second SL668 Audio PSU is used, a 1m cable (SSL Part No. 66D56105) is used to link one **O/P** socket from each supply. (Either **O/P** socket may be used.)

- The motor supply power cables (SSL Part No. 66D77817) have a standard length of 18 metres; other lengths can be supplied to special order.


S127E
S126E
S29E
S113E
S114E
S6SE
651 ACCESS
S146E
S105E
S106E
S95E
PATCHABLE VCA
A-H
41-48
1-8
49-56
9-16
57-64
17-24
65-72
25-32
73-80
33-40
VCA 1-8
KYBRD
S117E
POWER
POWER
S89E EVENTS 1-8
S89E EVENTS 1-8
S89E EVENTS 9-16
S89E EVENTS 9-16
CONSOLE MONITOR
DL01 MIC LINES
DL02 MIC LINES
DL03 MIC LINES
DL13 M/T RTN
DL21 M/T SEND
DL22 M/T SEND
DL23 M/T SEND
DL33 MASTER I/O
DL41 TRK/REM
DL42 TRK/REM
DL43 TRK/REM
EXTERNAL VIDEO INPUTS
COMPOSITE
1
2
3
4
Out
Out
TOTAL RECALL RGB
R
G
B
PRIMARY
SYNC
FADERS
CUTS
FADERS
CUTS
S595E
Keyboard
RGB Switch
SMPTE Out
Analogue Ground
SMPTE In
S29E
S39E
S113E
S89E1
S95E
S89E2

Studio Computer External Wiring - Automation

Automation wiring for a typical G-Series Ultimation system is shown in the diagram opposite. The following points should be noted:

- Connections to the computer are made via the sixteen 50-way **FADERS** sockets. One 50-way ribbon cable is required for each group of 8 channel or group faders, 8 VCAs, or pair of joysticks. Inside the rear panel of each computer is a 'Fader Map', showing the connections for that particular system. The example shown on the right corresponds to the wiring diagram opposite.

G Series Fader Map

9	FADERS 33-40	1	FADERS 1-8
10	FADERS 41-48	2	FADERS 9-16
11	FADERS 49-56	3	FADERS 17-24
12	FADERS 57-64	4	VCA GROUPS 1-8
13		5	FADERS 25-32
14		6	
15		7	
16		8	

All of the connections shown opposite are made with 50-way ribbon cables (see below). An engraved set of cable strain reliefs, supplied as part of the console cable kit, allows each cable to be identified at both ends to coincide with the rear panel connector designations. SSL Part Numbers for standard length cables (custom lengths are also available) are as follows:-

SSL Part No.	**Length**
66D79137	15m
66D79135	10m

- The 50-way ribbon cable from Group Faders 1-8 must be connected to an *even* numbered input on the *first* Analogue I/O system, i.e. '**FADERS 2**', '**FADERS 4**', '**FADERS 6**', or '**FADERS 8**' (See 'Fader Map' above). The Group Solo Bus is monitored on these inputs *only*; connection to any other input will result in all faders grouped to '0' being permanently cut.

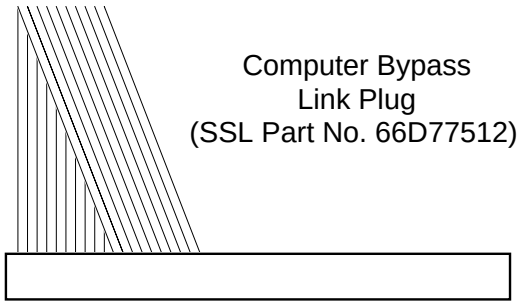
If the computer is fitted witsh a Dual I/O System (two 622356 and two 622357 cards), the Analogue Input cards are scanned in parallel, so channels 1 and 66, 2 and 67 etc. are read at the same time. Scanning of each card continues until the highest assigned channel for that card has been read. A card with no active channels will not be read at all. The Analogue Output cards are written to in parallel in the same manner.

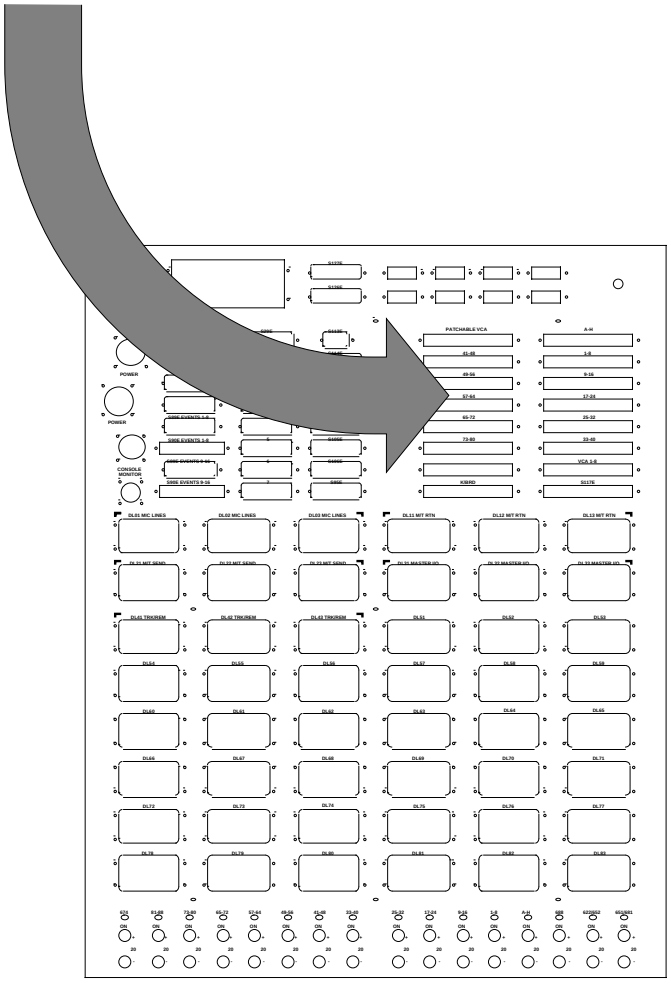
- For computers fitted with a Dual I/O System, the following conditions should therefore be met:-

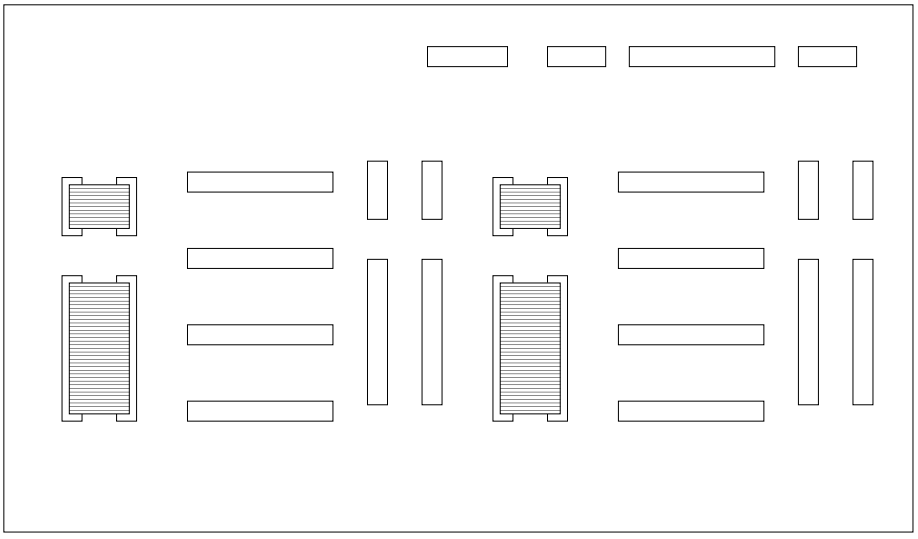
  - There must be no gaps between used '**FADERS**' connectors. Gaps do not prevent the system from working, but result in increased scan time due to the system having to process the unused channels.

  - The use of both columns of connectors ('**FADERS 1**'-'**8**' and '**9**'-'**16**') should be as even as possible starting from the top; the two sets of cards will then be used as evenly as possible, ensuring the fastest possible scan time.

Computer Bypass
Link Plug
(SSL Part No. 66D77512)







Studio Computer External Wiring - Bypass Links

The information on this page is relevant under the following situations:

- For consoles with no G-Series Computer fitted
- For consoles *without* Ultimation fitted
- For consoles where the computer link has failed (or is otherwise unavailable), to allow manual operation to continue

Consoles with no Computer

For consoles operating without a computer, a Computer Bypass Link Plug (SSL Part No. 66D77512) must be fitted into *every* **FADERS** connector in the console main connector panel.

Consoles with G-Series Computer

If the computer fails, the link between any console bay and the computer may be bypassed by fitting a Computer Bypass Link Plug (SSL Part No. 66D77512) into the appropriate **FADERS** connector on the console main connector panel (in place of the 50-way ribbon cables) to allow manual operation to continue. The action to be taken depends upon the mode of computer failure:

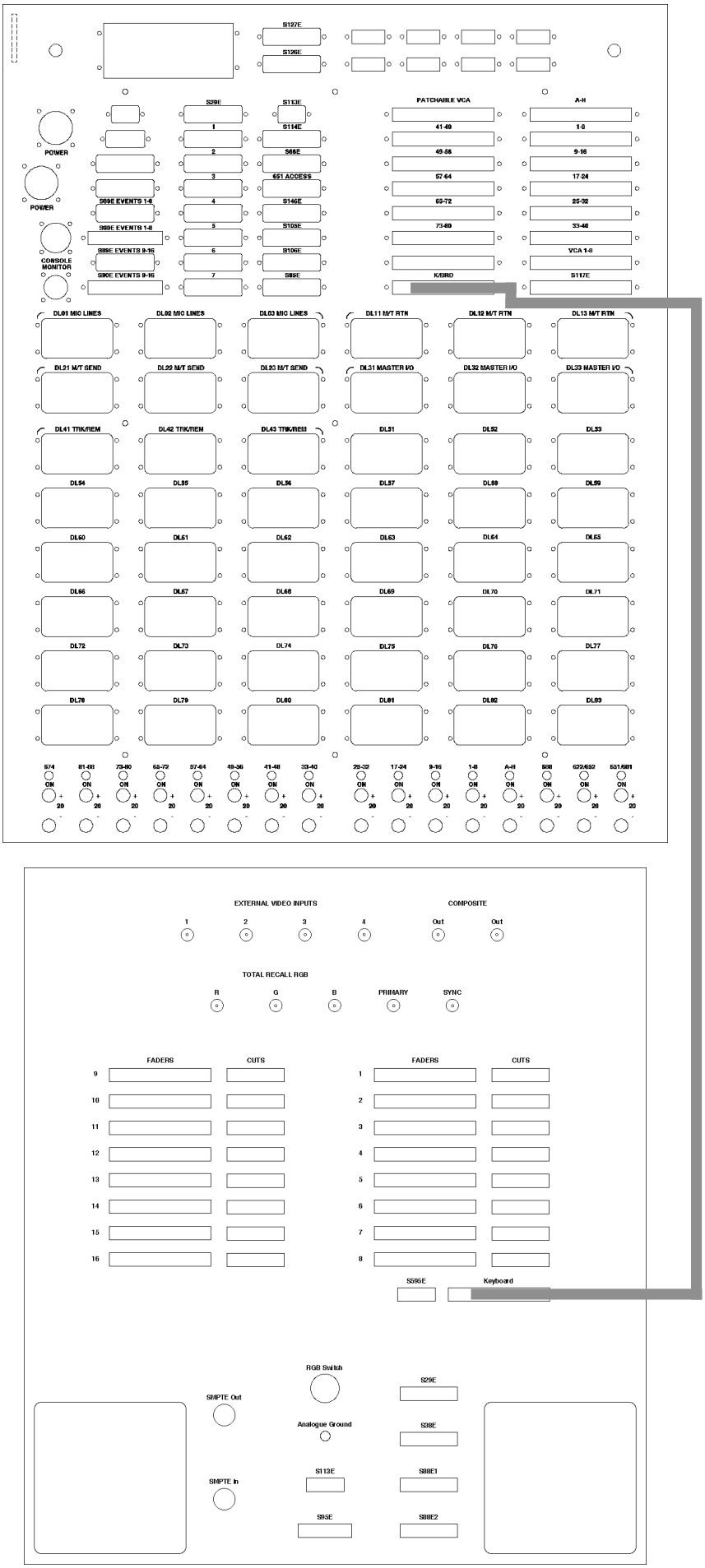
- **If the link between the computer and a single console bay fails,** unplug the 50-way cable feeding from the computer to the corresponding **FADERS** connector on the console main connector panel, and fit a Bypass Link Plug in its place.
- **If the link between the computer and the entire console fails,** unplug all of the 50-way cables feeding from the computer to the **FADERS** connectors on the console main connector panel, and fit Bypass Link Plugs in their place.

  There is an alternative method of bypassing the computer if the link between the computer and the entire console fails. This requires two short 50-way link cables and two short 20-way link cables. Open up the rear of the computer, and hinge down the back panel. Remove the cabling from the Analogue Input and Analogue Output Cards (see page 32) and replace them with the two pairs of link cables as shown in the lower diagram opposite. ***Be sure to link the correct pairs of connectors !***

General Notes

There is no requirement to power down the system (or any part of it) before replacing a computer link cable with a Computer Bypass Link Plug - simply remove the cable and fit the plug whilst the system is running.

Computer Bypass Link Plugs are polarised to prevent incorrect connection.


S127E
S126E
S29E
S113E
S114E
S65E
651 ACCESS
S146E
S105E
S106E
S95E
POWER
POWER
CONSOLE MONITOR
S89E EVENTS 1-8
S89E EVENTS 1-8
S89E EVENTS 9-16
S90E EVENTS 9-16
PATCHABLE VCA
A-H
41-48
1-8
49-56
9-16
57-64
17-24
65-72
25-32
73-80
33-40
VCA 1-8
K/BRD
S117E
DL01 MIC LINES
DL02 MIC LINES
DL03 MIC LINES
DL11 M/T RTN
DL12 M/T RTN
DL13 M/T RTN
DL21 M/T SEND
DL22 M/T SEND
DL23 M/T SEND
DL31 MASTER I/O
DL32 MASTER I/O
DL33 MASTER I/O
DL41 TRK/REM
DL42 TRK/REM
DL43 TRK/REM
DL51
DL52
DL53
DL54
DL55
DL56
DL57
DL58
DL59
DL60
DL61
DL62
DL63
DL64
DL65
DL66
DL67
DL68
DL69
DL70
DL71
DL72
DL73
DL74
DL75
DL76
DL77
DL78
DL79
DL80
DL81
DL82
DL83
S74
81-88
73-80
65-72
57-64
49-56
41-48
33-40
25-32
17-24
9-16
1-8
A-H
S88
622/632
631/881
ON
20

EXTERNAL VIDEO INPUTS
1
2
3
4
COMPOSITE
Out
Out
TOTAL RECALL RGB
R
G
B
PRIMARY
SYNC
FADERS
CUTS
9
10
11
12
13
14
15
16
FADERS
CUTS
1
2
3
4
5
6
7
8
S95E
Keyboard
RGB Switch
SMPTE Out
Analogue Ground
SMPTE In
S13E
S95E
S29E
S88E
S88E1
S88E2

Studio Computer External Wiring - Keyboard

The keyboard connection between computer and console consists of a single 50-way ribbon cable. This cable is shown in grey opposite. SSL Part Numbers for standard length cables (custom lengths are also available) are as follows:-

SSL Part No.	Length
66D79137	15m
66D79135	10m

Note that this cable also carries Multitrack Remote signals and Total Recall data.

Studio Computer External Wiring - Video

The main console video signals are fed via a cable connected between a square BICC socket on the G-Series Computer Backplane Card to the **CONSOLE MONITOR** BICC on the console main connector panel. The same video signal is available in composite form from the **PRIMARY** socket. This signal, together with **R**, **G**, **B**, and **SYNC** are fed to the external Total Recall monitor; these signals are designed to be fed into a SCART type I/F so that the external monitor may be switched between TR and normal display via the **RGB Switch** control.

Additional Video signal switching may be accomplished by use of the **EXTERNAL VIDEO INPUTS** - these four BNC connectors accept composite video inputs which, together with the composite video **PRIMARY** signal, are switchable to the external video monitor via pushbuttons above the console centre section monitor.

Studio Computer External Wiring - Machine Control

The term Machine Control covers a series of techniques whereby multiple audio or video recorders (machines) can be played together in synchronisation. Position information is determined by address information from each machine, normally based on a timecode recording, that identifies the position of each video frame or the equivalent piece of audio. The simplest form is **parallel** machine control, commonly found on reel to reel machines of almost all ages.

Parallel Machine Control

The G Series Computer provides a parallel Machine Control Interface.

- External switches are connected in parallel with the machine's transport controls (Play, Stop, etc.) and mounted remotely. The switch lamps ('tallies') may also be wired to the external switches. Optionally LTC can be recorded on one track of the tape and used as the timing reference for an automation system. Additionally, autolocator relays are connected in parallel with the remote switches, and LTC Tach and Direction signals are connected to the autolocator so that it can keep track of tape position while the machine is in wind.

- Serial Machines can be controlled via a suitable interface system, such as MotionWorker, Stramp, etc. Further details will be found on Pages 48-49.

Timecode and the SSL Studio Computer

The SSL Studio Computer is able to control a single tape machine transport. Using Tach and timecode, the computer can 'autolocate' to a specific and unique point (address) on the tape. Timecode is only read by the computer when the tape machine is in PLAY. When the machine is spooling, the computer interprets Tach pulses generated by the machine's transport to determine the approximate position of the tape. The computer also uses timecode and Tach to generate the necessary timing references used in the Mix.

The SSL computer will operate with any of the following four timecode standards:

Standard	Frame Rate
FILM	24
EBU	25
Dropframe (DF TC)	29.97
SMPTE	30

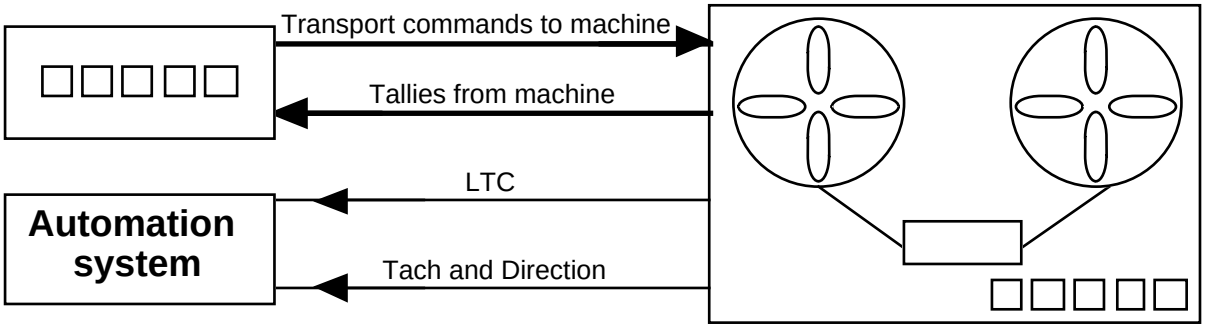
24 Frame FILM (EBU) is used in Film applications; 25 Frame EBU is the European Broadcast Union standard for audio and video applications; 30 Frame SMPTE and 29.97 DF TC are timecode standards devised by the Society of Motion Picture and Television Engineers and are in common use in the USA and Japan.

Although the SSL Studio Computer only generates 25 Frame EBU and 30 Frame SMPTE, it is capable of reading all the above standards.

Common Problems

There are relatively few problems interfacing a single parallel machine. Most of them relate either to incorrect wiring or to incorrect setup of the automation system:

Symptom	Cause
Timecode display counts in the wrong direction when in wind or rewind	*Direction sense incorrectly set*
Timecode display counts in the same direction whether winding forwards or backwards	*Direction sense not connected or not being read*
EBU / SMPTE flag does not come on, although timecode is connected and tach rate is set correctly	*The Title Page speed setting is set to 15 ips and the tape is playing at 30 ips. The G Series computer disables the timecode reader at 2 x play speed*



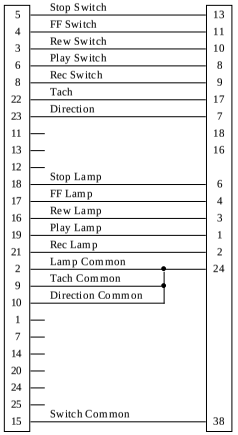
Typical Parallel Machine Control Setup

Things to Remember

- First decide upon the correct timecode standard, bearing in mind the difficulties in converting to alternative standards at a later date.
- Record timecode at the same tape speed as the material to be recorded on the other tracks.
- Make sure that the timecode track cannot be accidentally erased, by placing that channel of the recorder in 'Record Safe' mode.
- Do not physically edit the tape once continuous code has been recorded; the Mix System will not tolerate discontinuous code.

SSL Multitrack to Mitsubishi X880

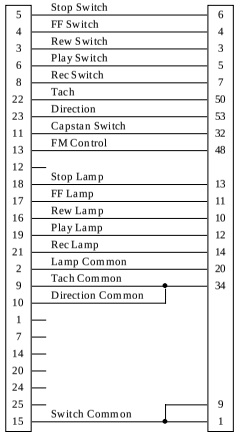
SSL Multitrack S29E D25F on cable — X880 Remote Amphenol 57-30500



Special Notes:

SSL Multitrack to Studer A800

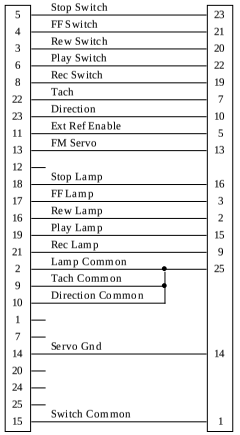
SSL Multitrack S29E D25F on cable — A800 GR31 78W 'D' Plug



Special Notes:

SSL Multitrack to Studer A810/A820/D820/A827/D827

SSL Multitrack S29E D25F on cable — Studer 'External Synchroniser' 25W 'D' Plug

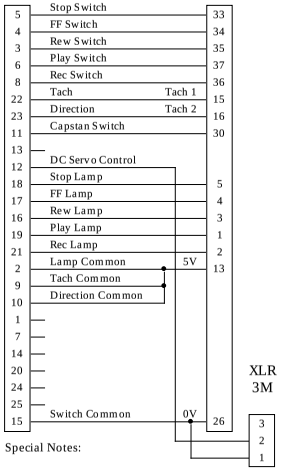


Special Notes:

Older machines may require modifying in order to provide Tach division. On newer machines Tach division is selected via jumpers. : These lines only required if synchroniser is used.

SSL Multitrack to Sony PCM 3324/3348

SSL Multitrack S29E D25F on cable — Sony 3348 37W 'D' Plug

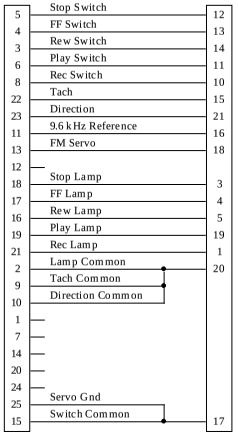


Special Notes:

Biphase Machines: 3324, 3324A, some 3348s
Tach & Dir Machines: Some 3348s
3324S and 3324HR are jumper selectable for Biphase or Tach and Dir

SSL Multitrack to Otari MTR 90 Mk I-III

SSL Multitrack S29E D25F on cable — MTR 90 25W Honda Plug

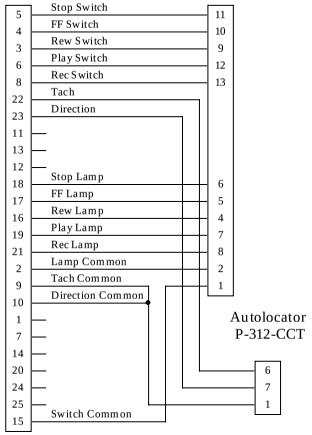


Special Notes:

MTR 90 Mk I-II: It may be necessary to connect the 9.6 kHz to pin 9 and not pin 16.

SSL Multitrack to MCI JH24

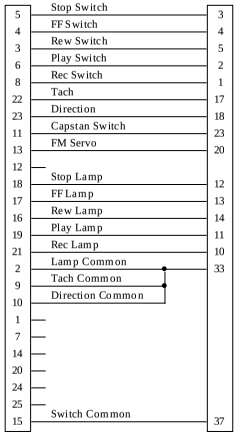
SSL Multitrack S29E D25F on cable — Remote Cinch-Jones P-324-CCT



Special Notes:

SSL Multitrack to Otari MTR 100

SSL Multitrack S29E D25F on cable — Otari MTR 100 37W 'D' Plug

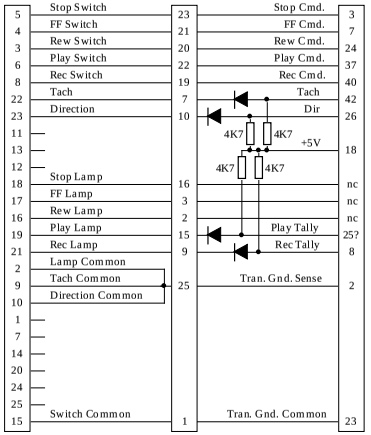


Special Notes:

The lamp common (pin 33) is 5V. For E series use pin 34 which is 24V.

SSL Multitrack to Studer A820 and Lynx

SSL Multitrack S29E D25F on cable — Studer A820 Synchroniser Port: D25M on cable — Lynx Module D50M on cable



Special Notes:

Parallel Machine Control Cabling

The diagrams opposite show the required machine control interface cabling for a variety of parallel machines. The following points should also be borne in mind:

- The G Series computer expects a maximum Tach Rate when in play of around 80pps. Some machines produce rates in excess of this, in which case a suitable Tach Pulse division circuit may be required (see below). The computer Parameters Page must be set up to reflect the resulting Tach Rate that will be 'seen' by the computer.

- SSL manufactures an interface (SSL Part No. 622234E2) which converts Biphase to Tach and Direction and also divides the Tach Rate. This part number includes card and box. The division ratio is configured by card links, and should normally be set to 5. Connection is by two 25-way D connectors (male connects to tape machine, female connects to console), having the same pin out as the SSL multitrack remote. The card is powered from the tape machine's 5V rail and does not require an external PSU.

- Some Sony 3324 and 3348 DASH machines generate Biphase rather than Tach and Direction (see opposite). The Biphase frequency is 250pps at 48kHz, or 229.7pps at 44.1kHz. Where only Biphase is available, the interface (see above) may be used. Later models have link options to generate Tach and Direction on the same pins as the biphase outputs. However if these are used the machine cannot be used with standard Timeline Lynx machine control cables, which incorporate a biphase to Tach and Direction convertor. The Tach and Direction outputs are also reversed on some machines, depending on the revision of the Sony machine control interface.

- External synchroniser units read timecode and Tach/Direction to determine frame address and phase relationship of both master and slave machines. The fundamental requirement for synchronisation of a machine with a parallel control port is the ability to varispeed the machine from an external controller. There are two interfaces in common use:

  - **DC Servo:** A variable DC voltage is used to control the speed of the machine. The most significant users of this technique are the Sony DASH machine range (3324 and 3348) and Studer A80 machines.

  - **FM Servo:** A square wave of variable frequency (commonly 9.6kHz for nominal play speed) is used to varispeed the machine. External varispeed ('servoing'). This is used by the majority of analogue multitrack machines.

  Many machines must be switched to respond to external varispeed commands. Sometimes this is done on the machine, but frequently the machine has an external switch input which must be activated for synchronisation to occur. This is given a variety of names, '**Capstan Enable**' or '**External Varispeed Enable**' being typical.

SSL G-SERIES COMPUTER / MOTIONWORKER / LYNX SYNCHRONISER INTERFACING

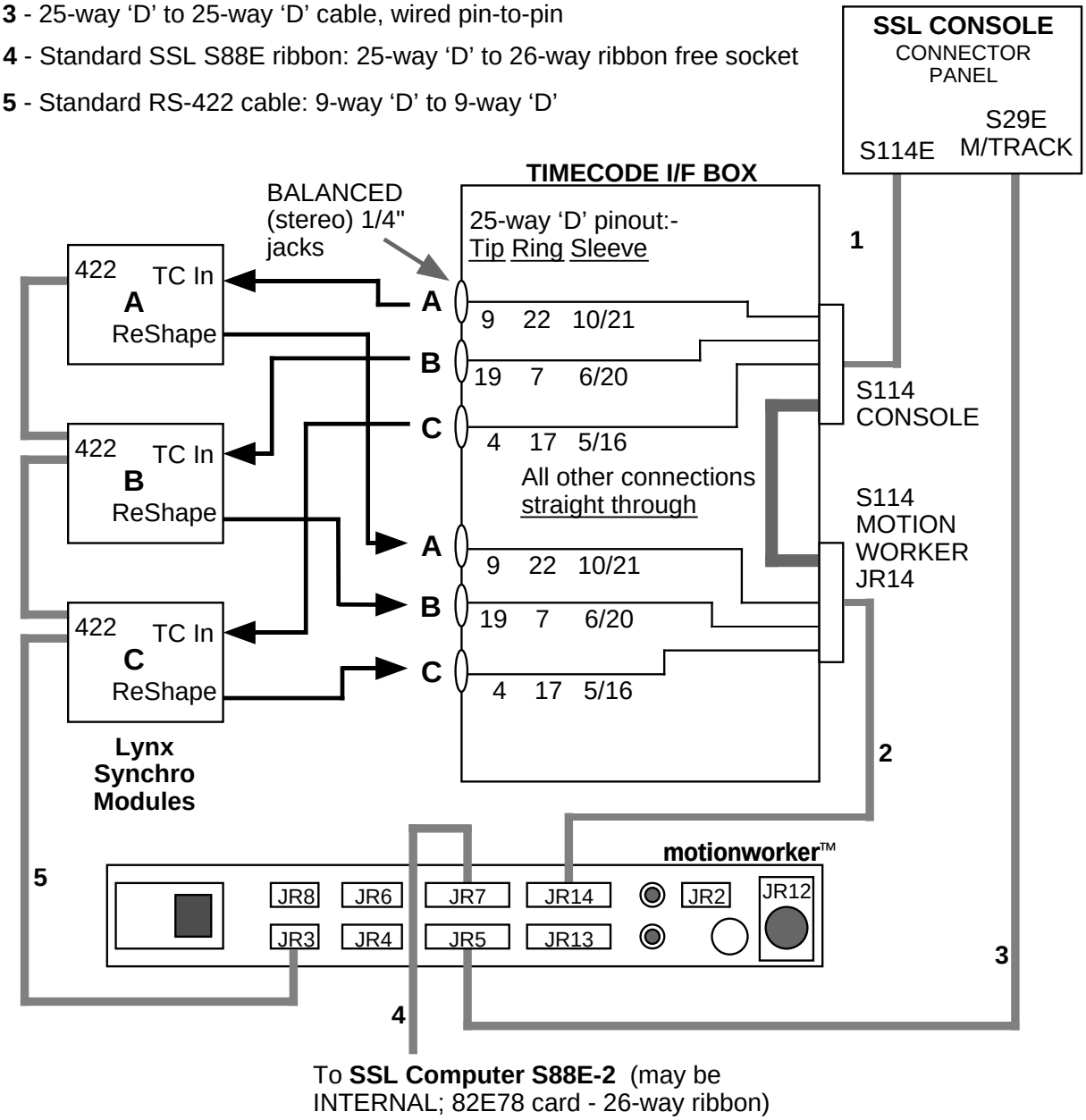
1 - Standard SSL S114E cable: 25-way 'D' to 25-way 'D'

2 - Additional 25-way 'D' to 25-way 'D' cable, wired pin-to-pin

3 - 25-way 'D' to 25-way 'D' cable, wired pin-to-pin

4 - Standard SSL S88E ribbon: 25-way 'D' to 26-way ribbon free socket

5 - Standard RS-422 cable: 9-way 'D' to 9-way 'D'



S29E - Transport commands from SSL Console / Computer (momentary contact closure)
- Transport Tallies to SSL Console
- Tach pulses and Direction info to SSL Computer
- Sync / Repro command (relay contacts) from SSL Console

S114E - Machines A, B & C Timecodes from SSL Patch
- Selected MASTER Timecode to SSL Patch

S88E-2 - Serial / parallel SSL-synchroniser communications (max recommended length 4m)

Serial Machine Control

The G Series Computer does not provide direct serial machine control. Serial control may be achieved by use of a synchroniser controller such as **motionworker™**, which provides control of up to five tape transports. (***motionworker™*** *must be fitted with the Serial Automation Interface Option and Software Version 3.1 or higher - contact MotionWorks if your system does not meet these minimum requirements.*)

Machines can be put on and off line from either the **motionworker™** status panel or the computer screen. Offsets can be adjusted dynamically and saved to disk as part of a project.

Connections between the G-Series computer and **motionworker™** are as follows:

- S29E remote from the console main connector panel to JR5 on **motionworker™**. This is a pin-to-pin 25-way 'D'-Type to 25-way 'D'-Type connection.

- S88E Serial / Parallel synchroniser connection from the 82E78 card in the G-Series rack to JR7 on **motionworker™**. This is a 25-way 'D'-Type to 26-way ribbon cable (Max. length 4m).

- Timecode must be wired from all machines that are to be controlled by **motionworker™** to the appropriate circuits on JR14, as well as to any synchroniser modules that are in use. The **motionworker™** master timecode output (the one on JR14, *not* the XLR, JR12) must be connected to one of the timecode reader inputs on the Timecode Interface Box. See the **motionworker™** manual for the pinout of JR14, and your Console Specification Manual for the pinout of the computer **TIMECODE** connector.

- **motionworker™** should be fed by the same video sync standard as the rest of the installation. This should be PAL for EBU operation or NTSC for SMPTE operation.